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# **An altmetric approach to measure the social media attention of COVID-19 articles**

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## **Abstract**

The outbreak of COVID-19 pandemic has shaken the entire world. This study aimed to measure how well COVID-19 articles attracted in the social web during the deadly pandemic period. A total of 145 articles from Nature journal were collected and analyzed to gauge the major metrics from various social platforms. The results showed that social media attention to the articles was fluctuating in each month recording an upward and downward trend. Twitter was the major carrier of COVID-19 articles with total 143452 mentions followed by news outlets with 5251 mentions. Articles were yet to penetrate in many other platforms like Highlights, Wiki, Video uploading and F1000. No metrics were recorded from reference managers manifesting that COVID-19 articles were travelling fast in social media rather than reference managers. Open access articles did not find any social media attention benefits compared to Non-open access articles. The findings of the study would give a proper insight into how well the COVID-19 articles are penetrated and discussed in social media platforms.

**Keywords – Social media, Altmetrics, Social media metrics, Altmetric Attention Score, Social media attention, Tweets, Citation, COVID-19, Corona.**

## **Introduction**

The coronavirus first reported in China on 31<sup>st</sup> December 2019 which was delineated to be upsurge from a seafood market in Wuhan city (Wu et al., 2020 & Sadia, Naveed, & Attya, 2020). The virus named as COVID-19 by WHO and declared as Public Health Emergency of International Concern (Poon & Peiris, 2020). The unfurling of the virus was very rapid across the globe covering 235 countries, areas or territories and killed 1074817 people as per the report of WHO on 13<sup>th</sup> October 2020(WHO, 2020a). Scientists across the world are trying to come up with a vaccine to battle against this virus and till date, no vaccine was safe to use. Researchers' on the other side started to study different aspects of this pandemic including medical treatment, nature of the infection, development of the vaccine, use of new methods and techniques in treatment etc. (Dadhe & Dubey, 2020). As a result, the growth of literature on COVID-19 was reported exponential

especially those which were open access(Torres-Salinas, Torres-Salinas, & Castillo-Valdivieso, 2020). At the same time, the rate of retracted papers also skyrocketed due to many reasons like data misrepresentation, false findings, duplication and so on(The retraction watch Database, 2020). WHO hosted their dedicated page for airing COVID-19 related studies titled *Global research on coronavirus disease (COVID-19)* which is updated daily with new scientific findings and suggestions to fight against the disease(WHO, 2020b). The social web also became a hot platform for discussing the COVID-19 and has become a hub of fake information which tempted many to take incorrect and panic decisions (Bhattacharya, 2020 & Srivastava, Shrivastava, Chhabra, Naqvi, & Sahu, 2020). Attempts were made at the global and national level to map the scientific research on COVID-19 by using bibliometrics and scientometric tools(Ahmad & Batcha, 2020; Khaparde, Dhage, & Muley, 2020; Bharati & Singh, 2020). Since social media became a scorching stage for discussing COVID-19, it is the need of the hour to measure how it has helped them to gain proper insights to take decisions regarding the pandemic. Little is known with regards to measuring the movement of COVID-19 literature in social platforms and this gap is going to bridge by the current study which would measure the social media attention of COVID-19 articles featured in Nature journal.

## **Objectives of the study**

1. To measure the major social media attention of COVID-19 articles.
2. To know whether open -access helps COVID-19 articles to propagate more on social platforms.

## **Previous studies**

Researchers across the globe are exploring various aspects of COVID-19 and accordingly studies with regards to COVID-19 are increasing exponentially(Torres-Salinas et al., 2020). Here we have reviewed only notable metric studies with regards to COVID-19. A good number of articles tried to measure COVID-19 articles by using bibliometrics measures. For example, Fan et al. (2020) explored the contents and efficacy of COVID-19 articles published in English and Chinese language. A total of 143 English and 721 Chinese articles were analyzed. The study reported that most of the authors were from China. Even though, the distribution of authors and institutions were mainly in developed countries or more wealthy areas of China. English articles had more extensive keywords compared to Chinese. Traditional Chinese medicine was the most frequent word found in Chinese papers compared to those in English. Zyoud & Al-Jabi (2020) conducted a bibliometric study of COVID-19 literature indexed in the Scopus database. The study reported a total of 19,044 publications in Scopus during the early stage of the outbreak including

9140 articles, 4192 letters, 1797 reviews, 1754 editorials, 1728 notes and 433 others. The USA was the top publisher of COVID-19 literature with 4479 publications followed by China with 3310 and Italy with 2314 publications respectively. In another similar kind of study by Gong et al. reported that the number of publications from a country was positively correlated with the severity of the COVID-19 outbreak. According to their findings, China was the topper in publications with 353 articles which has been confirmed in another study conducted by Chahrour et al. (2020). The Huazhong University of Science and Technology, Tongji Medical, and Harvard Medical School were the institutions that published the largest number of COVID-19 research. pathological findings, clinical features studies, therapeutic design and care facilities preparation and infection control were the major topics of COVID-19 publications.

Vasanth & Patil (2020) tried to number the publications on COVID-19 from India. They reported the rising trend of publications on pandemic from the early stage of the outbreak. A total of 89 publications were found in WHO COVID-19 database till 12<sup>th</sup> May 2020. The majority of the publications were authored collaboratively. No publications were reported to be produced from the North-Eastern region of the country. AIIMS and ICMR were the major contributors of publications and the Indian Journal of Medical research was the productive journal. It was also reported that most of the publications were associated with Epidemiology.

From the literature reviewed, it is sure that studies exploring the social media attention of COVID-19 articles are yet to come out. So this study would be the first of its kind to explore the altmetric attention of COVID-19 articles at the global level.

## **Data and Method**

This study is a journal-level altmetric study by exploring the COVID-19 articles published in Nature journal. Data for the study were collected from the journal (<https://www.nature.com/>.) manually from 12<sup>th</sup> June 2020 to 16<sup>th</sup> June 2020. To retrieve articles related to COVID-19, the advanced search feature available at the homepage of the journal was used. The keyword “*COVID-19*” was typed at the *find articles* tab after setting the publication date from 2019 to 2020. No restrictions were set for the journal, author, title and volume and start page/article number. A total of 1249 items were retrieved and for this study, we have selected only those literature which had listed as ‘Articles’ under the category of ‘Research’ in the journal. Thus, a sum of 145 articles was obtained. The next step was to collect the corresponding citations to articles. Each article was searched with its title in the *Web of Science* database to know how many times an article got cited. Further, to collect the major social media attention, each article was searched in Google by using the corresponding DOI of the articles and the “*Altmetric it*” bookmarklet offered by *Altmetrics.Com* was used to get the mentions from the corresponding opened articles. The major

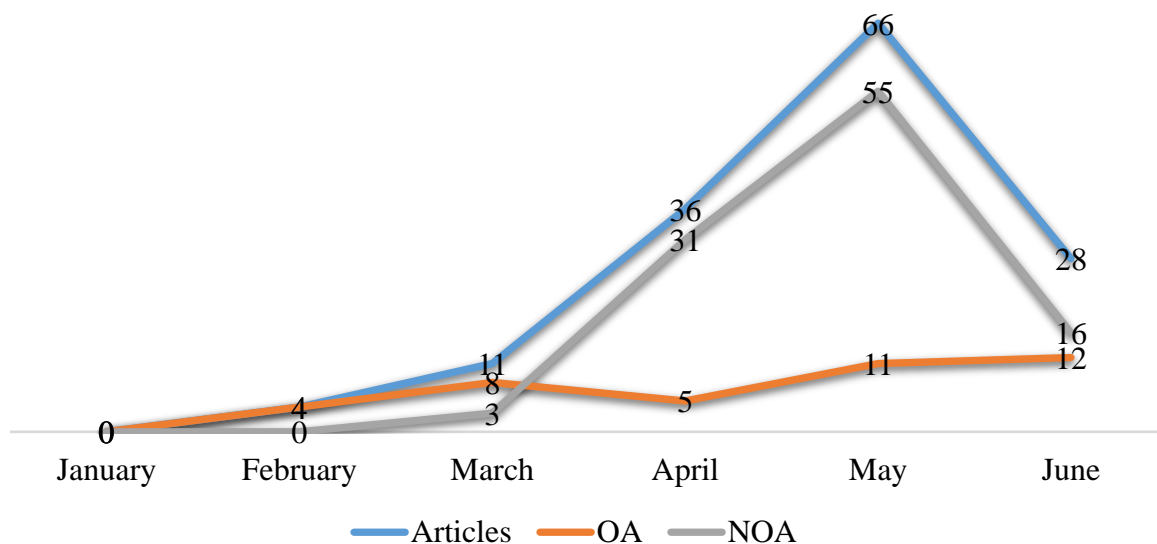
metrics scores were tabulated by using Excel and further subjected to one-sample t-test with the help of SPSS 21 edition.

## Results and discussion

The study tried to measure the social media attention of COVID-19 articles published in the Nature journal. The article publication from December to June is considered and major metrics from social platforms are gauged. Further, the open-access benefit of articles in getting social citations is determined. The major results are discussed following.

### Article distributions

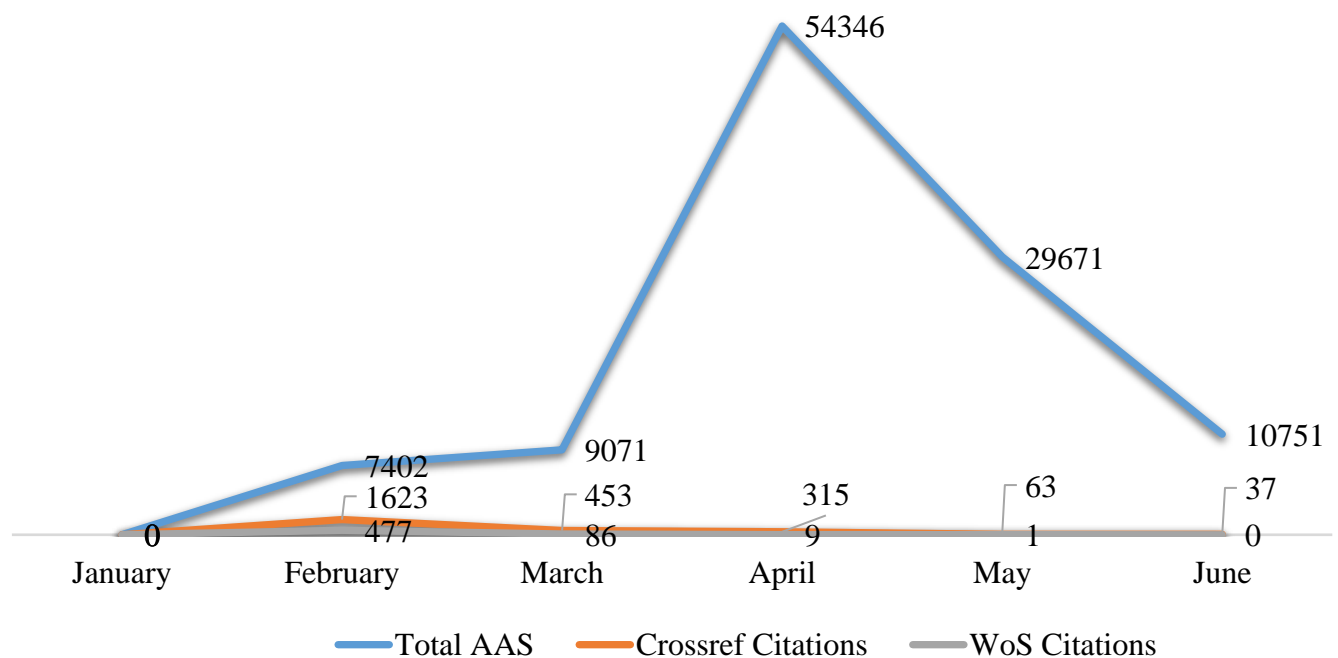
Nature is a world-famous multidisciplinary journal which features research mainly related to science, technology and natural sciences updated once in a week (Strielkowski & Chigisheva, 2018). The journal also featured articles related to COVID-19 and according to Figure 1, it is clear that the number of articles is increasing in each month. A total of 145 articles published in the journal till the mid of June including 40 OA and 105 NOA. Even though the pandemic outbreaked in December (Lavizzari et al., 2020), the journal recorded its first publication in February with 4 articles in open-access mode. The next month number of publications reached 11 including 8 OA and 3 NOA. In April, a total of 36 articles published in which the majority of them were NOA. The journal recorded the highest number of publications in May with 66 articles. Of which, 55 were NOA. The journal published 28 articles till the mid of Jun. It is interesting to see the declining trend of open access articles in the journal which accounts for 27.58% of the total publications. Previous studies are reporting that even the authors are aware of the open-access policies and repositories, their willingness to publish is limited (Zhu, 2017).



**Figure:-1 Article distributions**

## Social media attention and citation

Social media has become a novel platform for scientific discussions among the research community and altmetrics helps to track their discussions on each piece of literature. The *Altmetric.com* helps to measure how well an article travelled in social platforms and report a single score as *altmetric attention score* which is the cumulative attention received by an article from different online platforms like blogs, Twitter, Wikipedia, news, LinkedIn and Facebook (Holmberg & Park, 2018). As per Figure 2, articles published in February got a total altmetric score of 7402. The corresponding citation from Crossref and WoS were 1623 and 477 respectively. In March, 11 articles have received a cumulative social media attention score of 9071, while the citations from both the database were reduced. It is crystal clear that in April, articles have been well travelled in social media fetching a total attention score of 54346. The corresponding citations from Crossref and WoS were 315 and 9 respectively. In May and June, the articles were less attracted in the social web and managed to get a total altmetric score of 29671 and 10751 respectively. It is also noted articles were less cited in both the databases justifying that the citation will take time to accumulate (Mohammadi & Thelwall, 2013).



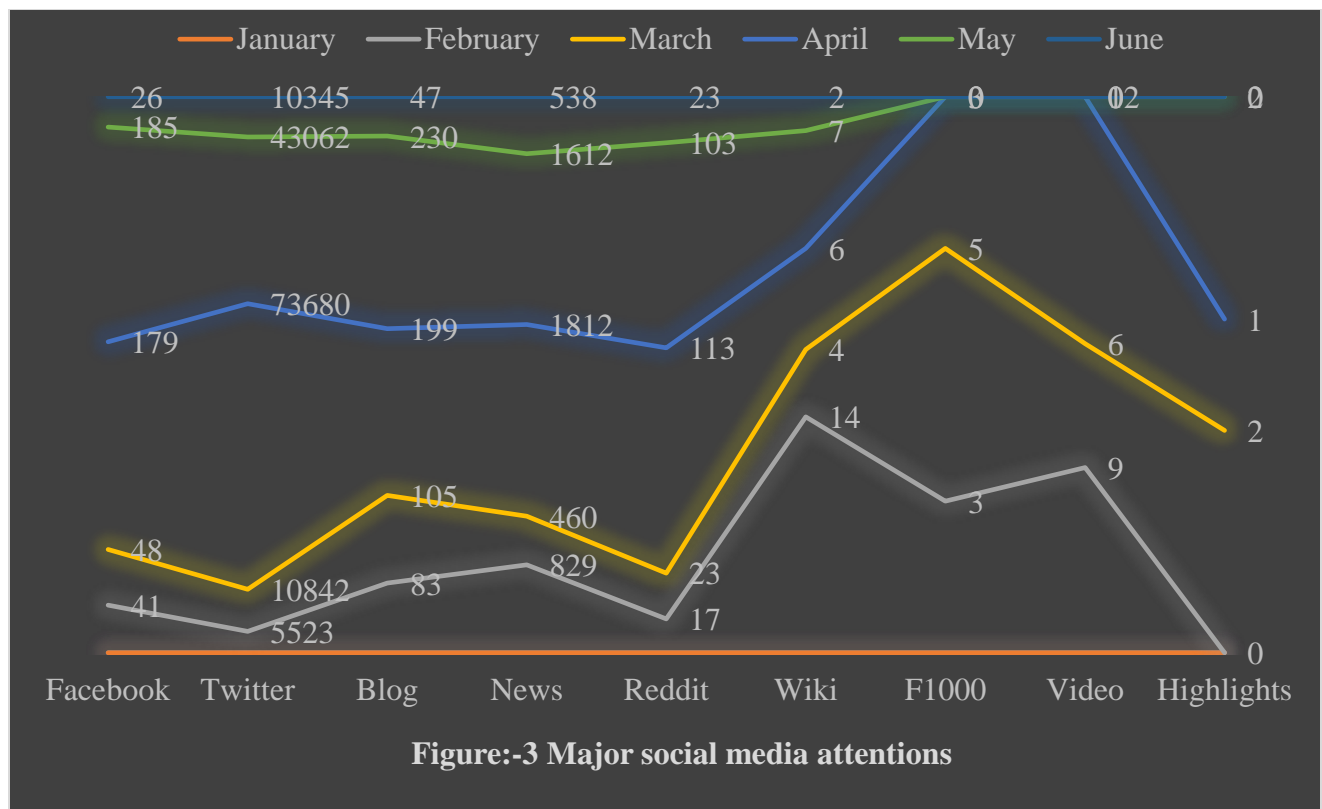
**Figure:-2 Altmetric attention score, Crossref and WoS Citations**

## Social media attention in detail

There are mainly 19 major sources of metrics as listed by Altmetric.com including major social media (Facebook & Twitter), reference managers (Mendeley), bookmarking (CiteULike) and other web sources(Wikipedia) (Altmetrics.com, 2020). The data in Table 1 and Figure 3 show the major social media attention received by COVID-19 articles. Twitter turned out to be the major platform for discussing the COVID-19 articles with a total score of 143452 which is 95.50% of the total score. It was reported from a previous study that *tweeting and retweeting* during the pandemic time would be at peak(Chew & Eysenbach, 2010). The articles published in April received the highest Twitter mentions with 73680 mentions. News outlets are the second major platform on which articles got significant buzz with a total mention of 5251 followed by Blogs with 664 posts. Facebook also became a major platform on which remarkable activities have happened about COVID-19 articles and received a total score of 479. It can also found from the table that in many platforms, articles are yet to penetrate like Wiki and F1000. The metric *Highlights* recorded the least mention of COVID-19 articles.

**Table:-1 Major social media attention**

Months	Facebook	Twitter	Blog	News Outlets	Reddit	Wiki	F1000	Video uploading	Highlights	Without Twitter	Total
January	0	0	0	0	0	0	0	0	0	0	0
February	41	5523	83	829	17	14	3	9	0	996	6519
March	48	10842	105	460	23	4	5	6	2	653	11495
April	179	73680	199	1812	113	6	3	12	1	2325	76005
May	185	43062	230	1612	103	7	0	0	2	2139	45201
June	26	10345	47	538	23	2	0	0	0	636	10981
Total	479	143452	664	5251	279	33	11	27	5	6749	150201



### Citations and Altmetric benefits

The debate on whether making an article free to get maximum citations and social media attention has existed over years. Many studies reported the positive side of open access (Gargouri et al., 2010 & Ottaviani, 2016). To what extend making the COVID-19 articles free to access helped to get social citations is evaluated in this study. The data has been subjected to one-sample t-test with the help of SPSS. Both citation and altmetric benefits were measured. It is clear from the Table 2 that open access has helped to get citations to the articles (p-value=0.016) but not social media attentions (p-value=0.186).

**Table:-2 Difference in Citations and Altmetric benefits among Open and Non-open access COVID-19 articles.**

	Access Types	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
<b>Citations</b>	NOA	105	5.705	15.4172	-2.441	143	<b>0.016</b>
	OA	40	47.300	173.7704	-1.512	39.234	<b>0.139</b>
<b>AAS</b>	NOA	105	905.676	2305.3585	1.328	143	<b>0.186</b>
	OA	40	403.625	1008.9162	1.820	140.296	<b>0.071</b>



## Findings and Conclusion

The present study conducted to gauge the social media attention of COVID-19 articles published in Nature journal. The question of whether open access publications outperform non-open access articles in terms of getting citations and social media attention is also solved. The study reported interesting findings. It was found that article publication regarding COVID-19 outbreak in Nature journal is exponential. A total of 145 articles were published till the mid of June 2020 in which the majority of the articles were non-open access. The articles transmitted well in social web especially in Twitter, news outlets, blogs and Facebook. Even though, articles are yet to crawl in some other platforms like F1000 and Highlights. Surprisingly, no metrics were recorded from reference managers justifying that COVID-19 articles are travelling fast in social media rather than reference managers. The result also showed that citation benefits exist among open access and non-open access. So the study would like to suggest all the authors be part of the open access policy by letting others to make use of their scientific results especially during this kind of pandemic period. Similarly, instead of considering the social media as a secondary medium, it should be used for conveying relevant information regarding the pandemic and government should take necessary actions to reduce the spreading of misinformation and rumors on the social web (Srivastava et al., 2020). The study is limited to research articles published in Nature journal for a limited period. An extended study can be conducted by exploring other literature types to know how well scientific outputs regarding COVID-19 has reached to the public through social platforms and to what extent it has helped to gain knowledge about the deadly disease.

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